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EXAMINER	
LIU, LI	
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)
	10/596,226	MAGRI ET AL.
	Examiner	Art Unit
	LI LIU	2613

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on 15 December 2010.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 10 and 13-27 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 10,15-21 and 27 is/are rejected.

7)☒ Claim(s) 13,14 and 22-26 is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on 05 June 2006 is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.

5) ☐ Notice of Informal Patent Application

6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

1. Applicant's arguments filed on 12/15/2010 have been fully considered but they are not persuasive. The examiner has thoroughly reviewed Applicant's amendment and arguments but firmly believes that the cited reference reasonably and properly meet the claimed limitation as rejected.

1). Applicant's argument – the primary reference, Saleheen, discloses lasing of ASE noise in a WDM ring network. Saleheen also employs lasing of the ASE noise to maintain a constant amplifier gain. However, Saleheen is conspicuously silent regarding a mechanism to handle a change in the channels.

Caprino discloses a method that allows traffic channels added to a span in an optical fiber telecommunications system to survive a break in a preceding span. Caprino, however, utilizes a control system wherein the optical amplifiers minimize ASE noise while amplifying the traffic channels during normal operation.

The control system of Caprino is distinct from the system of Saleheen. Particularly, in response to a sudden drop of traffic channels, such as when a fiber breaks, for example, the optical amplifier gain in Caprino is maintained by amplifying the ASE. Saleheen, as stated previously, uses lasing of the ASE noise to maintain constant amplifier gain. Therefore Caprino does not use the ASE lasing mechanism of Saleheen. Moreover, given these distinctive and contrary approaches to controlling optical amplifier gain, no one skilled in the art would ever combine the teachings to the references of Saleheen and Caprino.

Examiner's response – Reference Saleheen teaches a WDM optical ring network and a plurality of EDFA arranged in the ring, and a spectral response in the ring is configured such that ASE noise circulating around the ring in a lasing mode is used to clamp a gain of each doped fiber optical amplifier.

As indicated by the Applicant, Saleheen may be "silent regarding a mechanism to handle a change in the channels".

However, Caprino teaches "a mechanism to handle a change in the channels" and a controller to control the optical amplifier to produce a substantially constant output power or to maintain a substantially constant pump power and to switch the optical amplifiers to a gain control mode after detecting a fiber break to maintain a gain at substantially a level provided by the optical amplifiers prior to the detected loss.

It may be true that the control system of Caprino may be different from the system of Saleheen; that is because Saleheen mostly deals with the normal operation of the ring network and Caprino handles a situation as "to a sudden drop of traffic channels, such as when a fiber breaks".

Therefore, the combination of Caprino and Saleheen can obtain a stabilized ring network and "to survive a break in a preceding span", and system reliability can be enhanced, and the transient effect can be controlled. Or, although the control system of Saleheen may different from the control system of Caprino, they can compensate with each other so that the WDM ring network can operate properly at both normal condition and "when a fiber breaks".

2). Applicant's argument – The other reference, Stentz, fails to remedy Saleheen and Caprino. .... .

... Stentz also uses an amplifier control mechanism that is distinct from the lasing peak mechanism of Saleheen. Because the mechanisms are so different, no one skilled in the art would ever combine Saleheen and Stentz.

Further, the control equipment in Stentz cannot be used to detect the absence of an ASE lasing peak. As such, combining these three cited references would not produce tile claimed invention.

Examiner's response – The reference Stentz is used to teach detect an absence of an ASE lasing peak. As shown in Figures 2, 4 and 6 etc, a detector circuitry is used to detect the absence of the ASE signal. And a wavelength selective coupler (5 in Figures 4 and 6) is used to select specific peak (or wavelength) of the ASE. That is, the control equipment in Stentz can be used to detect the absence of an ASE lasing peak. By combining Stentz with Saleheen and Caprino, the detector circuitry in the combined system also can be used to detect a loss of a lasing peak.

3). Applicant's argument – for at least the foregoing reasons, the cited references, Saleheen, Caprino, and Stentz, do not teach or suggest, alone or in combination, amended claim 10 or any of its dependent claims.

Examiner's response – As discussed above, Saleheen teaches a WDM optical ring network and a plurality of EDFA arranged in the ring, and Caprino teaches to control the optical amplifier to produce a substantially constant output power or to maintain a substantially constant pump power and to switch the optical amplifiers to a

gain control mode after detecting a loss of signal to maintain a gain at substantially a level provided by the optical amplifiers prior to the detected loss, and Stentz teaches to detect a ASE lasing peak. Then, the combination of Saleheen and Caprino and Stentz teaches/suggests amended claim 10.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 10 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Salehee (Salehee: "Closed Cycle Lasing of ASE Noise in a WDM Ring Network", CLEO/Pacific Rim 2001, 15-19 July 2001, Vol. 2, pages II-558-559) in view of Caprino et al (WO 02/080409) and Stentz et al (US 7,019,894).

1). With regard to claim 10, Salehee discloses a wavelength division multiplex optical ring network (Figure 1) comprising :

optical fiber arranged in a ring configuration (Figure 1);

a plurality of doped fiber optical amplifiers (Figure 1, the EDFA) arranged in the ring, wherein a spectral response in the ring is configured such that amplified spontaneous emission (ASE) noise circulating around the ring in a lasing mode (e.g., the channel 4 acts as the lasing channel/mode) is used to clamp a gain of each doped fiber optical amplifier (Figures 3 and 4, the gain of each amplifier is clamped).

But, in Figure 1 etc, Salehee does not expressly show that a controller associated with each optical amplifier to control the optical amplifier to produce a substantially constant output power or to maintain a substantially constant pump power; and detector circuitry configured to switch the optical amplifiers to a gain control mode after detecting a loss of the lasing peak to maintain a gain substantially at a level provided by the optical amplifiers prior to the detected loss.

However, as shown in Figures 3 and 4, by using the VOA and lasing channel, the output power of the amplifier is substantially constant. Another prior art, Capriono et al, discloses that the system (controller and method) to control the optical amplifier to produce a substantially constant output power or to maintain a substantially constant pump power is known in the art (page 5 line 20-29 and page 7 line 9-16, "[t]he site optical amplifiers are allowed to work with constant output power settable by means of <u>known electronic control loops</u>. The laser pumps are also controlled in a <u>known manner</u> in order to hold constant the output power without regard for the input power"); and detector circuitry (Capriono: page 5 line 20-29 and page 7 line 9-16, the control of the optical amplifiers is switched from a normal operation mode "power control mode" to a "gain-control mode" when the amplifier receives no input. It is inherent that a detector circuitry is in Caprino's system so that it can detect whether an input signal is received) is configured to switch the optical amplifiers to a gain control mode after detecting a loss of the input signal to maintain a gain at substantially a level provided by the optical amplifiers prior to the detected loss (Capriono: page 5 line 20-29 and page 7 line 9-16, the optical amplifiers is switched from a normal operation mode "power control mode" to

a “gain-control mode” when the amplifier receives no input to maintain a gain at substantially a level provided by the optical amplifiers prior to the detected loss, or “when there is no input signal the amplifier increases its power gain to amplify the internal noise until it takes its own output power to the value which it was predetermined that it should keep”.

But, Capriono et al does not expressly state to detect an absence of a lasing peak.

However, Stentz et al teaches an amplifier having automatic gain control using the ASE as the monitor parameter (Figures 3-8, and as shown in Figures 2, 4 and 6 etc, a detector circuitry is used to detect the absence of the ASE signal). And a wavelength selective coupler (5 in Figures 4 and 6) is used to select specific peak (or wavelength) of the ASE.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use the controller/detector circuitry and the ASE lasing peak as the monitoring signal as taught by Capriono et al and Stentz et al to the system of Salehee so that the system can determine the line condition more accurately, and a constant output power from the amplifier can be obtained, and the system performance and reliability can be enhanced, and the transient effect can be controlled.

2). With regard to claim 20, Salehee and Capriono et al and Stentz et al disclose all of the subject matter as applied to claim 10 above. And the combination of Salehee and Capriono et al and Stentz et al further discloses wherein a working point of the optical amplifiers is changed while in use to restore a level of the ASE peak in the event

of a slow drift of the optical amplifiers (Figures 3 and 4 of Salehee, and Capriono: page 5 line 20-29 and page 7 line 9-16, "the amplifier be controlled so as to have constant output power without concern for the input power, equation (5) is automatically verified because of the amplifier control loop").

4. Claims 15-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Salehee and Caprino et al and Stentz et al as applied to claim 10 above, and in further view of Roberts (US 5,969,840).

1). With regard to claim 15, Salehee and Capriono et al and Stentz et al disclose all of the subject matter as applied to claim 10 above. And the combination of Salehee and Capriono et al and Stentz et al further disclose wherein the detector circuitry further comprises:

a splitter (e.g., 70 in Figure 6 of Stentz) configured to tap a fraction of each optical amplifier's input power; and

a photodiode (72 in Figure 6 of Stentz) configured to measure the input power.

But, Salehee and Capriono et al and Stentz et al do not expressly discloses a plurality of splitters and a plurality of photodiodes configured to measure the input power.

However, to use a plurality of splitters and photodiodes to measure the input power is known in the art. Roberts teaches a system and method to monitor the input power of an optical amplifier (Figure 1, the element 3 can be an optical amplifier, column 5 line 4) in which a plurality of splitters (e.g., one splitter in front the amplifier 3,

and other splitters are in the Control System 5 as shown in Figure 2) and a plurality of photodiodes (Figure 2, the PIN diode in device 6, column 5 line 21-26) configured to measure the input power.

Capriono et al teaches to measure the total input power, Stentz et al teaches to monitor specific ASE band, and Roberts teaches to use a plurality photodiodes to monitor different bands. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use multiple splitters and photodiodes as taught by Roberts to the system of Salehee and Capriono et al and Stentz et al so that both the total input power and ASE lasing peak can be monitored at the input of the amplifier, and the system monitoring and controlling can be more accurate and reliable.

2). With regard to claim 16, Salehee and Capriono et al and Stentz et al and Roberts disclose all of the subject matter as applied to claims 10 and 15 above. And the combination of Salehee and Capriono et al and Stentz et al and Roberts further discloses wherein the plurality of splitters are further configured to tap a fraction of each optical amplifier's output power (e.g., Stentz: tap 64 in Figure 6), and wherein the plurality of photodiodes are further configured to measure the output power (e.g., Stentz: photodiode 66. Or Figure 7 of Roberts).

3). With regard to claim 17, Salehee and Capriono et al and Stentz et al and Roberts disclose all of the subject matter as applied to claims 10 and 15 above. And the combination of Salehee and Capriono et al and Stentz et al and Roberts further discloses wherein the detector circuitry further comprises a filter to pass only ASE noise, and a peak detector to detect the presence or absence of the lasing peak (Stentz

teaches to monitor specific ASE band, and Roberts teaches that a particular wavelength band is monitored, therefore it is inherent a filter is used in the system of Roberts so that the particular wavelength band can be detected. That is, the combination of Salehee and Capriono et al and Stentz et al and Roberts a filter to pass only ASE noise, and a peak detector to detect the presence or absence of the lasing peak).

4). With regard to claim 18, Salehee and Capriono et al and Stentz et al and Roberts disclose all of the subject matter as applied to claims 10 and 15 above. And the combination of Salehee and Capriono et al and Stentz et al and Roberts further discloses wherein the detector circuitry further comprises a filter to pass only ASE noise, and control logic to detect a simultaneous decrease in the powers of both the ASE noise peak and the total power input (Stentz teaches to monitor specific ASE band, and Roberts teaches that a particular wavelength band is monitored, therefore it is inherent a filter is used in the system of Roberts so that the particular wavelength band can be detected, and Roberts also teaches a control logic, e.g., devices 7/8 in Figure 2, which detects/determines the powers of each band; and the combination of Salehee and Capriono et al and Stentz et al teaches to monitor the ASE noise. That is, the combination of Salehee and Capriono et al and Stentz et al and Roberts teaches/suggests a filter to pass only ASE noise, and a control logic to detect a simultaneous decrease in the powers of both the ASE noise peak and the total power input).

5). With regard to claim 19, Salehee and Capriono et al and Stentz et al and Roberts disclose all of the subject matter as applied to claims 10 and 15 above. And the

combination of Salehee and Capriono et al and Stentz et al and Roberts further discloses wherein the detector circuitry further comprises a detector to detect a decrease in the input power to each optical amplifier (Capriono teaches a detecting circuitry that detects whether an input signal is received. And Stentz et al and Roberts teach to monitor the input power. That is, the combination of Salehee and Capriono et al and Stentz et al and Roberts teaches/suggests wherein the detector circuitry comprises a detector to detect a decrease in the input power to each optical amplifier).

5. Claims 21 and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Caprino et al (WO 02/080409) in view of Salehee (Salehee: "Closed Cycle Lasing of ASE Noise in a WDM Ring Network", CLEO/Pacific Rim 2001, 15-19 July 2001, Vol. 2, pages II-558-559) and Stentz et al (US 7,019,894).

1). With regard to claim 21, Caprino et al discloses an optical amplifier comprising:

a controller configured to control an optical amplifier to produce a substantially constant output power, or to maintain a substantially constant pump power (page 5, line 25-29 and page 7 line 9-16, "[t]he site optical amplifiers are allowed to work with constant output power settable by means of known <u>electronic control loops</u>", The laser pumps are also controlled in a <u>known manner</u> in order to hold constant the output power without regard for the input power"); and

detector circuitry (Capriono: page 5 line 20-29 and page 7 line 9-16, the control of the optical amplifiers is switched from a normal operation mode "power control mode"

to a “gain-control mode” when the amplifier receives no input. It is inherent that a detector circuitry is in Caprino’s system so that it can detect whether an input signal is received) configured to switch control of the optical amplifier to a gain control mode after detection of a loss of an input signal in which the gain before the loss of the input signal is maintained.

But, Caprino et al does not expressly disclose the amplifier is a doped fibre optical amplifier for a wavelength division multiplex optical ring network comprising optical fibre arranged in a ring configuration, and the controller controls the amplifier using amplified spontaneous emission (ASE) noise circulating around a ring in a lasing mode to clamp a gain of the optical amplifier.

However, Salehee a doped fibre optical amplifier for a wavelength division multiplex optical ring network comprising optical fibre arranged in a ring configuration (Figure 1), and a controller controls the system such that amplified spontaneous emission (ASE) noise circulating around the ring in a lasing mode (e.g., the channel 4 acts as the lasing channel/mode) to clamp a gain of the optical amplifier (Figures 3 and 4, the gain of each amplifier is clamped).

But, Caprino et al and Salehee do not expressly disclose to detect an absence of a lasing peak, and the controlling is in response to detection of a loss of the lasing peak.

However, Stentz et al teaches an amplifier having automatic gain control using the ASE as the monitor parameter (Figures 3-8, and as shown in Figures 2, 4 and 6 etc, a detector circuitry is used to detect the absence of the ASE signal). And a wavelength

selective coupler (5 in Figures 4 and 6) is used to select specific peak (or wavelength) of the ASE.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to apply the teaching of Salehee and Stentz et al to the system of Caprino so that the controlling/monitoring can be used in an optical ring system, and ASE lasing peak can be used for monitoring purpose, and the system can determine the line condition more accurately, and a constant output power from the amplifier can be obtained, and the system performance and reliability can be enhanced, and the transient effect can be controlled.

2). With regard to claim 27, Capriono et al and Salehee and Stentz et al disclose all of the subject matter as applied to claim 21 above. And the combination of Capriono et al and Salehee and Stentz et al further discloses wherein a working point is changed in use to restore the level of the ASE peak the optical amplifier drift (Figures 3 and 4 of Salehee, and Capriono: page 5 line 20-29 and page 7 line 9-16, "the amplifier be controlled so as to have constant output power without concern for the input power, equation (5) is automatically verified because of the amplifier control loop").

Allowable Subject Matter

6. Claims 13, 14 and 22-26 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

7. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to LI LIU whose telephone number is (571)270-1084. The examiner can normally be reached on Monday-Friday, 8:30 am - 6:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ken Vanderpuye can be reached on (571)272-3078. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Li Liu/
Primary Examiner, Art Unit 2613
February 2, 2011